

Cosmic-Ray Acceleration on supernova remnant shocks

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Supernova remnants (SNRs) have been considered as the sources of the bulk of Galactic cosmic-ray (CR). Recently some evidences of extended gamma-ray emission are reported by e.g. LHAASO and H.E.S.S. and this emission infers the existence of particles escaping from accelerating region of SNRs.

In this work, we solve one-dimensional diffusion-convection equation coupled with analytical solutions for shock dynamics, to obtain the time evolution of phase-space distribution function of CR. As a result, the time evolution of CR acceleration still increases even after the age of 10kyrs in our models, and this behavior is largely affected by environment of SNRs.

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